Flood Protection Planning for New Orleans and the Louisiana Coast

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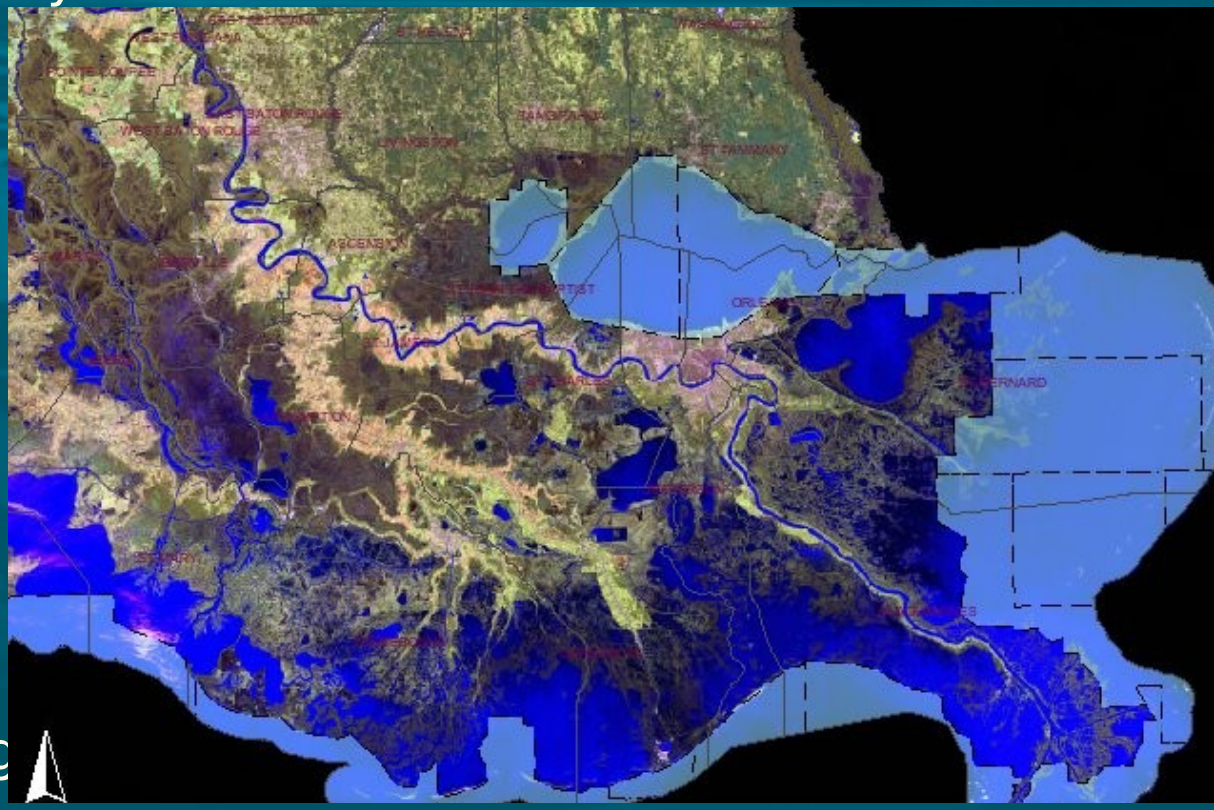
Unprecedented challenges and opportunities

- Scope, scale, complexity
- Competing interests
- Short timeframe
- Interdependencies
  - Flood protection
  - Redevelopment
  - Coastal, ecosystem restoration



- Collaborative planning framework needed
- Sustainable public support, financial commitment needed

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Interim plan and plan implementation

- Principle objective – prepare levees for next hurricane season
- Immediate needs (ASCE Nov. 2005 Report):
  - Floodwall interior erosion protection
  - Restoration and/or raising of levees to variable heights
  - Transition improvements

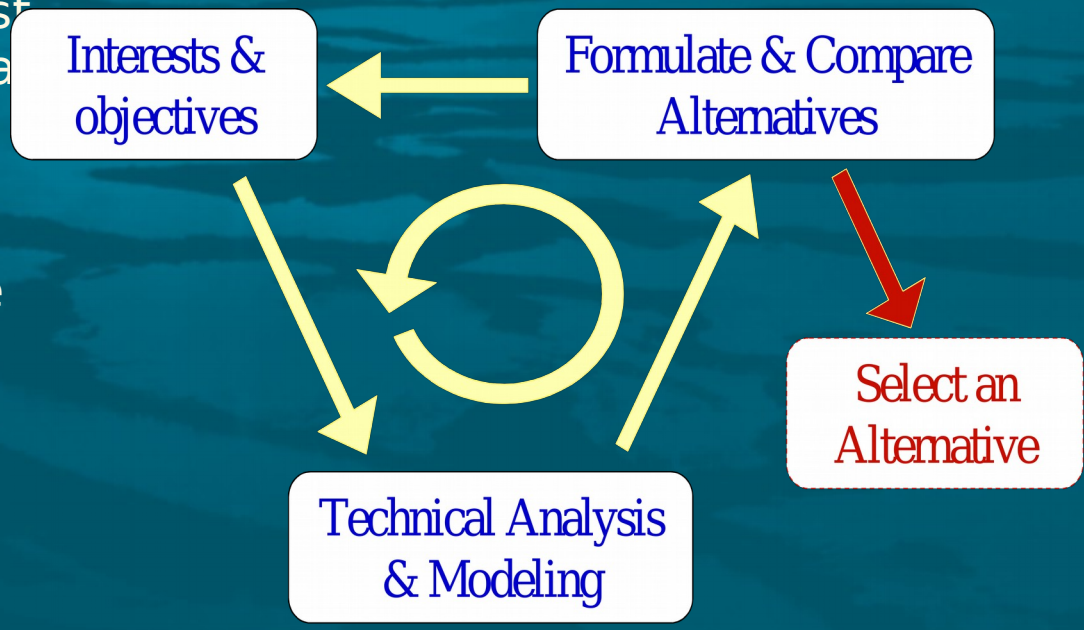
LAST LINE OF DEFENSE: HOPING THE LEVEES HOLD
Army Corps of Engineers officials say hurricane levees in the New Orleans area will protect residents from a Category 3 hurricane moving rapidly over the area. But computer models indicate even weaker storms could find chinks in that armor.
BARRIERS OF EARTH AND CONCRETE
Levees and floodwalls that protect against flooding from both the Mississippi River and hurricanes are built by the Army Corps of Engineers and are maintained by local levee districts. The corps and the local districts share the construction cost of hurricane levees, while the Mississippi River levees are a federal project. Local levee districts also build and maintain nonfederal, lower-elevation levees with construction money from each district's share of property taxes and state financing.
LEVEES AND FLOODWALLS
Mississippi River
Hurricane protection
Interior parish
HEIGHT ISN'T EVERYTHING
Different factors permit Lake Pontchartrain levees of varying elevations to withstand an 11½-foot storm surge plus several feet of waves:
Levees on higher ground and separated from the water by 5 miles of marshland need be only 12½ feet tall
Lake Pontchartrain
Marsh
Levees fronted by boulders and concrete rubble breakers can be about 14 feet high
Breakwaters
Levees without any breakers need to be about 17 feet tall or taller
Seawalls on the water must be 22 feet high
THE LEVEE SYSTEM:
NEW ORLEANS
FARTHER SOUTH
Residents and businesses in developed areas along bayous and the Mississippi River have successfully argued that the benefits of building levees around their communities outweigh the costs of construction.
LAROSE TO GOLDEN MEADOW LEVEE
This 40-mile ring levee encircles residential and commercial developments along Bayou Lafourche. Parts of the levee are being raised to counteract subsidence.
NEW ORLEANS TO VENICE LEVEES
There are 37 miles of levees in this project on both sides of the Mississippi River between Phoenix and St. Jude to the north and Bohemia and Venice at the southern end of the river. Different pieces of the levee are 60 percent to 99 percent complete.
LEVEE HOT SPOTS AROUND NEW ORLEANS:
1 ST. CHARLES PARISH
Construction of a new drainage structure west of Louis Armstrong International Airport is part of an incomplete 10-mile levee from the Bonnet Carre Spillway to the parish line, five miles inland from Lake Pontchartrain. Computer models indicate storm surge from smaller hurricanes would flood populated areas toward the river through gaps.
2 ST. CHARLES–JEFFERSON PARISH LINE
This 5-foot to 10-foot wall of sandbags and sheet piling runs south of Airline Drive to the Mississippi River levee near the airport. Surge water from the lake could pool along the river levee and pour over this barrier into Jefferson Parish and New Orleans, according to computer models.
3 WEST BANK
More than 60 miles of levees and floodwalls from east of the Harvey Canal to west of Lake Cataouatche – including this stretch of completed floodwall and yet-to-be-raised levee along Bayou Segnette State Park – are years from completion. Small hurricanes can push water from Timbalier and Barataria bays into West Bank neighborhoods.
4 JEFFERSON–ORLEANS PARISH LINE
Chesterfield Street passes through a low levee from Monticello Avenue in Jefferson Parish into New Orleans near the city's water plant. Computer models indicate this is the likely spot for floodwater to enter the city from St. Charles and Jefferson parishes during hurricanes.
5 JEFFERSON–ORLEANS PARISH LINE
The Hammond Highway bridge over the 17th Street Canal is being replaced with a new, hurricane-resistant structure. Huge sandbags are kept nearby to plug this hole in the hurricane protection for Jefferson and Orleans parishes.
6 NEW ORLEANS
The Filmore Avenue bridge over the London Avenue Canal is being replaced with a new span with floodwalls. Until its completion, only sandbags will stop hurricane surge from pouring into city neighborhoods.
7 ST. BERNARD–PLAQUEMINES PARISH LINE
A computer model indicates storm surge could overtop a V-shape area where levees meet at the parish line near the Caernarvon Freshwater Diversion Project along the east bank of the Mississippi River.
8 EASTERN NEW ORLEANS AND ST. BERNARD PARISH
Computer models indicate surge from Lake Borgne might rise in the Mississippi River–Gulf Outlet and overtop New Orleans levees near the Paris Road bridge and a section of levee in St. Bernard during a hurricane.
Sources: Army Corps of Engineers, New Orleans District; Orleans Levee District; East Jefferson Levee District; West Jefferson Levee District; Lake Borgne Basin Levee District; Plaquemines Parish Levee District
Research: Emmett Mayer III and Mark Schleifstein
Staff graphic by Emmett Mayer III/emayer@timespicayune.com
STAFF PHOTOS BY ELLIS LUCIA, ALEX BRANDON AND DEVAUNSHI MAHADEVIA

Interim plan and plan implementation (continued)

- Other possible components:
  - Mississippi River Gulf Outlet (MRGO) modifications
  - Pump station improvements
  - Greater Corps involvement in evacuation planning
  - Repair/restore critical barrier islands

Comprehensive planning – traditional P&G approach

- Step 1 – Identify problems and opportunities
- Step 2 – Inventory and forecast resources within planning area
  - Without-plan condition
  - Life-cycle costs and benefits
- Step 3 – Formulate alternative plans
- Step 4 – Evaluate alternative plans
- Step 5 – Compare alternative plans
- Step 6 – Select recommended plan
  - No action, NED, NER, locally-preferred plan



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Limitations of traditional planning

Flood protection planning must be integrated with overall redevelopment planning, i.e. should consider how New Orleans, LCA, MRGO and the port will look 5-10 years from now. The short time available for planning, the complexity and interdependency of the problems to be addressed, the need for consensus among diverse interest groups, and lack of quantitative economic and environmental impact measures greatly impede plan formulation, evaluation and selection in the traditional sense.

- Data requirements for effects accounting
- In past, cost-sharing policies have prevented comprehensive planning
  - Inadequate funding (appropriations, local sponsors)
- Economy-environment interactions not well understood → "engineered solutions"
- First-generation coastal flood modeling techniques ill-suited to risk-based planning and design
- Diminished institutional capacity for comprehensive planning
  - Interdependent, competing demands
  - High conflict potential
  - Lack of cooperation and coordination among federal, state and local agencies

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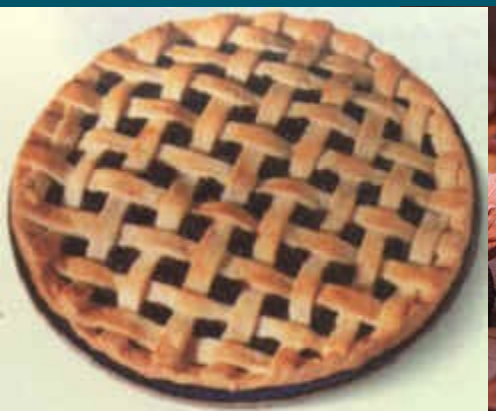
Alternative approach – shared-vision planning (SVP)

SVP process:

- Build team, identify problems
- Develop planning objectives and metrics
- Describe the status quo (future without plan condition)
- Formulate alternatives
- Evaluate alternatives, develop team recommendations
- Select, institutionalize and implement plan
- Exercise and update the plan (adaptive management)



SVP advantages:

- Builds on P&G, expedites planning
- Relies on structured collaboration to build consensus, reduce conflict
- Seeks satisfactory compromise vs. maximum benefit
- Applies qualitative and quantitative performance measures
- Facilitates federal-state-local-private partnering (planning and plan implementation)
- Promotes adaptability and sustainability
- Engenders public and political support needed for plan implementation

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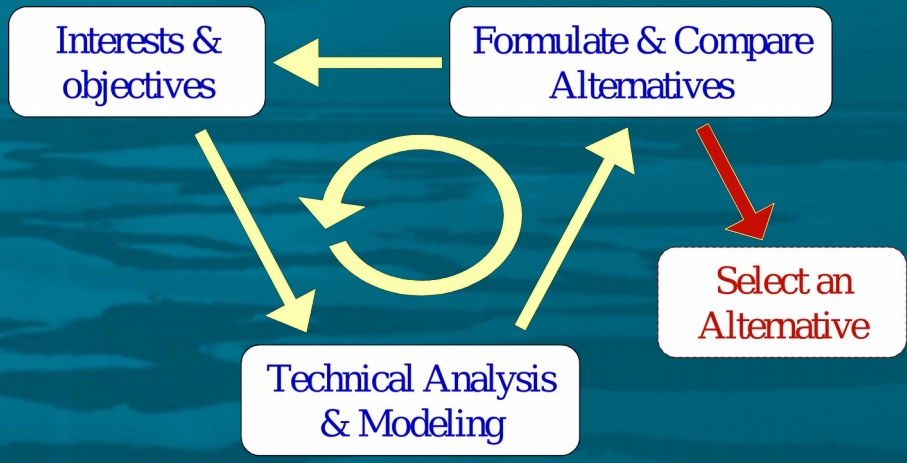
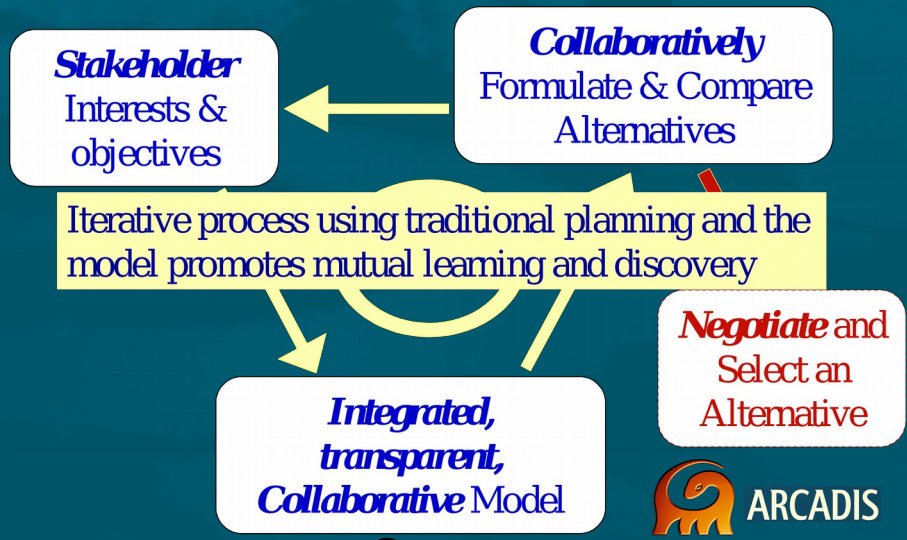
What is shared-vision planning?

Shared-vision planning incorporates tried-and-true planning principles, technical analysis and public participation into a practical forum for making resource management decisions (IWR 2005)



How is shared-vision planning different from traditional planning?

- *Integrated, collaborative, transparent, iterative, learning*
- *Focus on "satisficing" vs. "optimizing"*
- *Structured framework for collaboration and conflict resolution*


Stakeholder Interests & objectives
Collaboratively Formulate & Compare Alternatives
Iterative process using traditional planning and the model promotes mutual learning and discovery
Negotiate and Select an Alternative
Integrated, transparent, Collaborative Model
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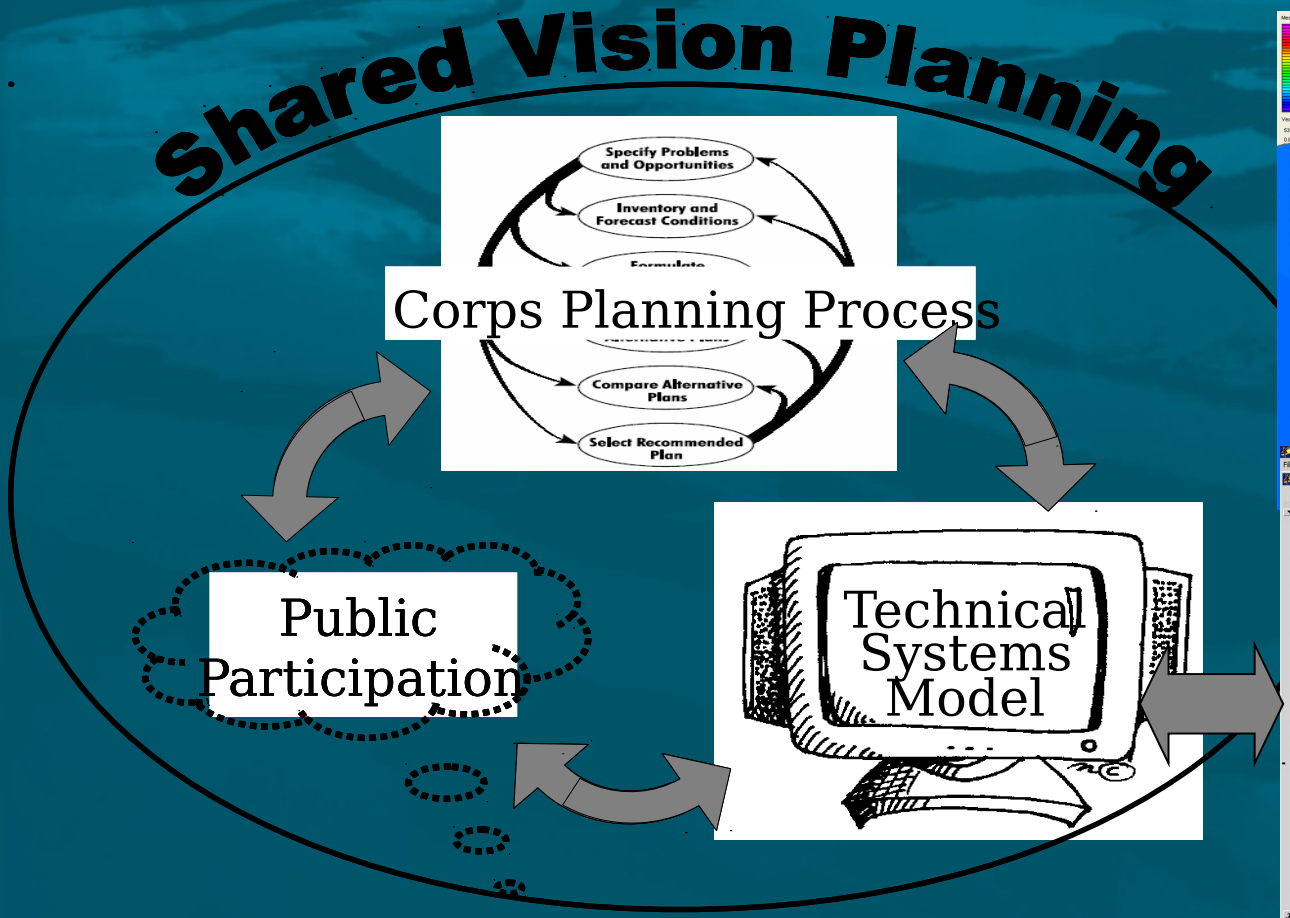
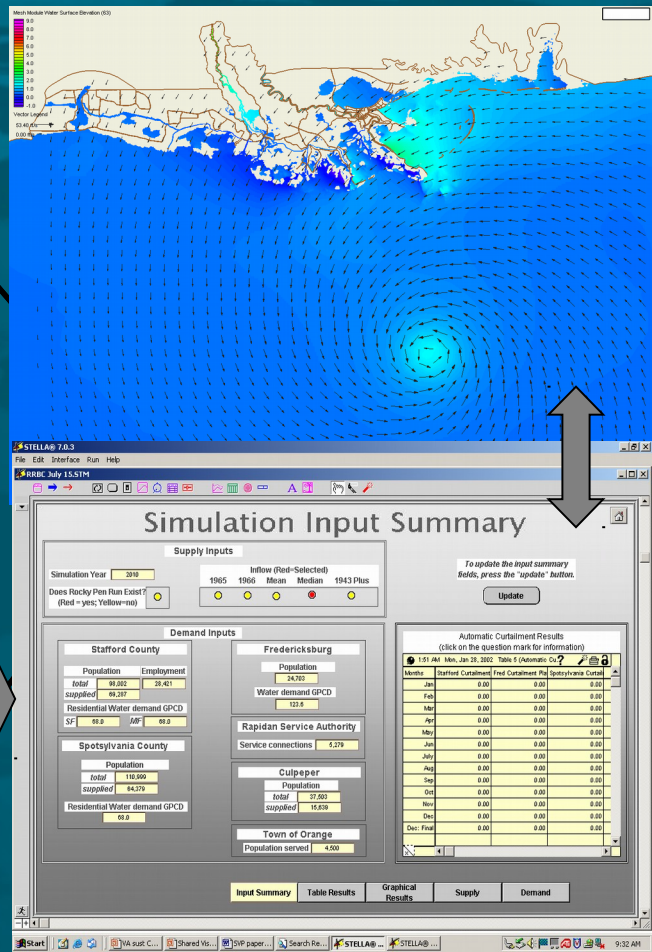
Pillars of shared-vision planning

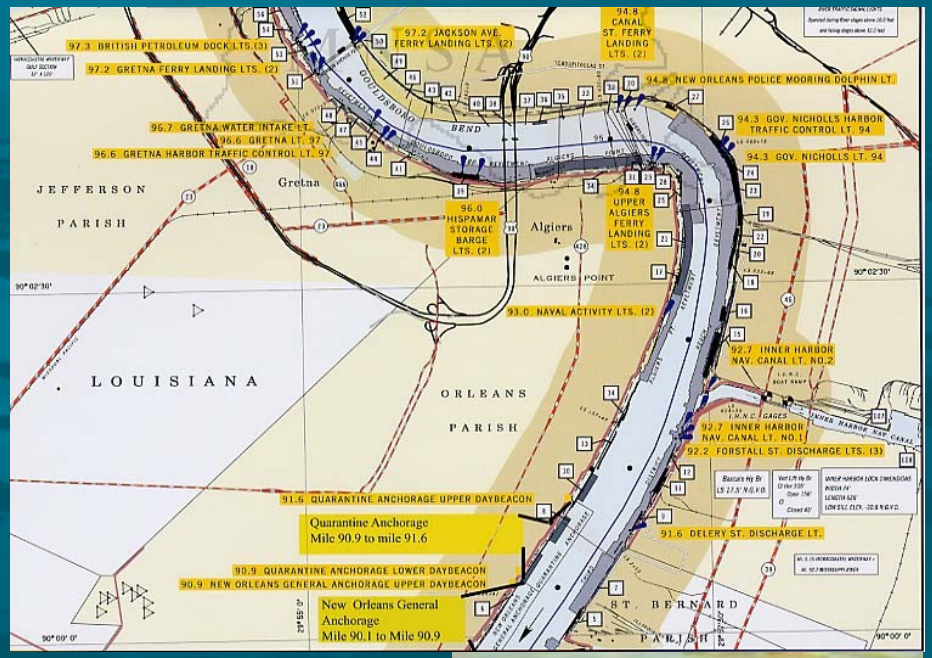
- Traditional water resources planning
- Structured public participation
- Technical systems model(s) – collaboratively developed linked physical, economic and environmental interactions





Conclusions, ideas, suggestions

- Short-term plan – preparation for 2006 hurricane season
- Long-term comprehensive planning:
  - Integrated (flood protection-redevelopment, coastal restoration)
  - Short timeframe (4 – 6 months)
  - Insufficient data, interdependencies preclude cost-benefit analysis and traditional planning process
  - High degree of public participation and consensus required
  - Sustainable public, political and financial support critical to success



Shared-vision planning is well-suited to address these issues and offers good prospects for success

Corps has pioneered the development and application of SVP in the U.S.

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